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APPALACHIAN FOREST EXPERIMENT STATION

Ten Years Growth After a Partial Cutting in a
Mixed Hardwood Stand

The woods practice provisions of the Lumber Code, which are directed toward selective or partial cutting of commercial timber, lend great interest to the relatively few examples of such cuttings in the past for which accurate records are available. The data here presented relate to such a cutting made on the Berea College forest near Berea, Kentucky, in 1923. On two sample areas aggregating 6.3 acres all standing trees 4 inches and over d.b.h. (diameter breasthigh) were measured before and directly after the cutting. Two other sample areas, totaling 1.5 acres were left uncut for comparison. All the areas were remeasured in the fall of 1928 and again in the Spring of 1934.

Basswood, red oak, sugar maple, hickory, and white ash together made up about 75 per cent by board foot volume of the original stand. The cutting, which was made by the College at a substantial profit, left a considerable number of thrifty medium sized and small trees standing for future growth, as shown in Table 1.

Table 1. Numbers of trees per acre before and after cutting.

Area No.		1/			2/	
		Commercial species			Non-commercial species	
		Diameter breasthigh inches			All diameters 4" and larger.	
		4 - 9	10 - 12	13 and larger		
1	Before cut	110	22	29	43	
	after cut	34	13	6	5	
3	Before cut	113	22	26	53	
	After cut	69	12	7	11	
2	(Uncut)	120	18	20	46	
4	(Uncut)	120	14	26	33	

1/ Includes sugar maple, basswood, beech, white ash, yellow poplar, black, red, white and chinquapin oaks, black walnut, black locust and hickory.

2/ Includes red bud, dogwood, hophornbeam, butternut, black gum, mulberry, coffee tree, elm, etc.

The average stand per acre on the cut areas before the cutting was 6,887 bd. ft. in trees 12 inches d.b.h. and larger, which was reduced to 1,237 bd. ft. by the logging. The growth in the 10 years following the cutting brought the average volume up to 3,063 bd. ft. The average net growth per acre per year was therefore 183 bd. ft. The corresponding average growth figure for the uncut areas, which had an average stand of 5,141 bd. ft. in 1923, was 97 bd. ft. per acre per year.

Table 2 compares the growth and mortality of the stands on all four areas. Area 1 and 2 have been free from fire since the cutting. Area 3 has been burned over once and area 4 twice since the logging. The differences in growth shown in the table are largely due to fire. Fire is responsible for the heavy mortality in area 4.

Table 2. Volumes of trees 12 inches d.b.h. and larger before and after cutting, growth and mortality.

Area No.:	Volume per acre	Per cent	Average net	Average annual
:	Before cut- After cut:	of bd.ft:	annual growth :	mortality per
:	:	volume	per acre for	acre for 10 yr.
:	:	cut	10 yr. period :	period following
:	:	:	following cut- :	cutting.
:	:	:	ting :	:
1 (cut)	1/			
:	bd.ft.	bd.ft	%	bd.ft.
:	6999	1156	83	228
:	:	:	:	19.8:
3 (cut)	6797	1302	80	146
:	:	:	:	11.2:
2 (uncut)	4554	4554	0	249
:	:	:	:	5.5:
4 (uncut)	5434	5434	0	22
:	:	:	:	0.4:
:	:	:	:	121
:	:	:	:	2.2
:	:	:	:	burned twice

1/ Scribner board foot volume to a variable top diameter. These figures do not allow for cull and represent close utilization. For average utilization reduce all board foot volumes by 20%. Percentages will remain the same.

Inspection of Table 1 shows that 19 trees per acre 10 inches d.b.h. and larger, 6 or 7 of which were 13 inches d.b.h. and larger, were left per acre. These were among the thriftiest of the small sawlog trees. The growth shown in Table 2 was made almost entirely by the trees above 9 inches in diameter. Had the cutting left only trees of the 9 inch class or under, it is doubtful if any merchantable growth would have occurred during the first 10 years.

The large quantity of rapidly growing young trees filling openings left by the cuttings, found during the examination of 1934, insures the continuing productivity of the areas after the next cutting of the larger trees.

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